

R. GEOGRAPHICUM (L.) DC. *Lecidea geographica* (L.) Schaer. *Buellia geographica* (L.) Tuck. Le Vieillard au Sud, *Dodge 2667*, Mt. Dunraven, *Dodge 2873*, Tabletop range; between Mt. Logan and Mt. Pembroke, *Dodge 2665*, Logan range.

BUELLIA MYRIOCARPA (DC.) Mudd. Gaspé county, *Macoun*.

### CLADONIACEAE

BAEOMYCES PLACOPHYLLUS Ach. between Mt. Mattaouisse and Mt. Collins, *Dodge 2167*;\* Gaspé coast below Ste. Anne des Monts, *Macoun*.

\*B. RUFUS (Huds.) DC. *B. byssoides* (L.) Schaer. R. Madeleine *Macoun*.

(To be continued.)

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## TWO SUMMERS OF BOTANIZING IN NEWFOUNDLAND.

M. L. Fernald.

(Continued from p. 155.)

DESCHAMPSIA ATROPURPUREA (Wahlenb.) Scheele. Wet quartzite rocks and gravel by brooks, gulches of Bard Harbor Hill, Highlands of St. John, the first stations in Newfoundland: upper Deer Pond Brook, *Fernald, & Long*, no. 27,462; Southwest Gulch, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,463. See p. 116.

AGROSTIS CANINA L. Moss and silicious rocks along rill, slope of South Hill, St. John's *Fernald, Long & Dunbar*, no. 26,257; margin of cold brook in spruce thicket, Bay Bulls, no. 26,258; gravelly margin of Goose Pond, Whitbourne, no. 26,259; dry gneiss crests and ridges and peaty barrens, Port aux Basques, nos. 26,260, 26,262. Older collections indicate that the species is indigenous across the breadth of southern Newfoundland. See pp. 50, 56, 81, 85.

A. PALUDOSA Scribn. Dry gravelly limestone barrens, St. John's Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,479, the first Newfoundland station. Described from Blanc Sablon, Labrador but represented in the Gray Herbarium from as far west as Ouapitagonne, Saguenay Co., Quebec (*St. John*, no. 90,123 as *A. borealis*). See p. 118.

A. MELALEUCA Trin. Springy swales and limy bog-barrens near the Rock Marsh, Flower Cove, *Fernald, Long & Dunbar*, nos. 26,253, 26,280, *Fernald, Pease & Long*, no. 27,481, *Fernald*, no. 27,483; dripping quartzite cliffs and ledges, upper Deer Pond Brook, High-

lands of St. John, *Fernald & Long*, no. 27,482; the only stations known in eastern America. See pp. 63, 109.

*CALAMAGROSTIS PICKERINGII* Gray. Wet boggy tundra in central valley of Quirpon Island, *Fernald & Long*, no. 27,484, the first from north of Notre Dame Bay and Bonne Bay.

*C. PICKERINGII*, var. *DEBILIS* (Kearney) Fernald & Wiegand. Boggy barrens ("mesh") south of Ship Cove, *Fernald, Wiegand & Long*, no. 27,485, the first from north of Notre Dame Bay and Bonne Bay.

*AMMOPHILA BREVILIGULATA* Fern. Dunes and sandy beach, Sandy Cove, Ingornachoix Bay, *Fernald, Long & Dunbar*, no. 26,273, the first Newfoundland station north of Bay St. George. See p. 80.

*ALOPECURUS AEQUALIS* Sobol. Brookside in bushy swale on flat north of Doctor Hill, St. John Bay, *Fernald, & Wiegand*, no. 27,503; shallow water of old beaver pond near the Yellow Marsh, back of Bard Harbor, St. John Bay, *Gilbert & Hotchkiss*, no. 27,504; the only stations known north of Port-à-Port. See p. 127.

*A. AEQUALIS*, var. *NATANS* (Wahlenb.) Fern., *RHODORA*, xxvii, 198 (1925). Pools in tundra, Boat Harbor, *Fernald, Wiegand & Long*, no. 27,505. See p. 107. Known outside the arctic and sub-arctic regions only along the Straits of Belle Isle.

*MUHLENBERGIA RACEMOSA* (Michx.) BSP. Boggy meadow bordering pond, Bard Harbor, St. John Bay, *Hotchkiss*, no. 27,509, the first from north of Bay of Islands. See p. 127.

*ORYZOPSIS ASPERIFOLIA* Michx. Knoll in spruce thicket, St. John's Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,510, the first from north of Bay of Islands.

*MILIUM EFFUSUM* L. Abundant in glades and gulches of Bard Harbor Hill, Highlands of St. John, the only Newfoundland region known for it except shores of Ingornachoix Bay. See p. 111.

*HIEROCHLOE ODORATA* (L.) Wahlenb. Abundant in swales and tundra along the Straits. The previous Newfoundland collections belong to the seashore var. *FRAGRANS* (Willd.) Richter.

*ERIOPHORUM SCHEUCHZERI* Hoppe. Wet swales and margins of ponds, Flower Cove, *Fernald, Long & Dunbar*, no. 26,334, *Fernald Pease & Long*, nos. 27,443, 27,444, the first authentic stations in Newfoundland. See pp. 61, 109.

*E. CHAMISSONIS* C. A. Meyer., var. *AQUATILE* (Norman) Fernald, *RHODORA*, xxvii, 207 (1925). Shallow pool at base of Cape Dégrat, Quirpon Island, *Fernald & Long*, no. 27,545, the only known American station. See p. 120.

*E. OPACUM* (Björnstr.) Fernald. Abundant in limy bog-barrens and tundra along the Straits of Belle Isle. See pp. 53, 62, 98.

*E. CALLITRIX* Cham. See Fernald, *RHODORA*, xxvii, 205 (1925). Wet peaty limestone barrens and tundra along the Straits of Belle Isle, the only region known for the species except St. Lawrence Bay on the western side of Bering Straits. See pp. 98, 105.

RYNCHOSPORA ALBA (L.) Vahl. Boggy meadow bordering pond, Bard Harbor, St. John Bay, *Hotchkiss*, no. 27,570, the first from north of Bonne Bay. See p. 127.

CAREX CAPITATA L. Peaty margins of pools in limestone barrens back of Big Brook, *Fernald & Long*, no. 27,575; peaty margins of pools in limestone barrens on the Highlands northeast of Big Brook, *Pease & Griscom*, no. 27,576; dryish tundra, Schooner (Brandy) Island, *Pease & Long*, no. 27,577; the first stations in Newfoundland. See pp. 98, 99.

C. INCURVA Lightf. A characteristic turf-plant on damp limestone along the Straits, eastward to Eddies Cove, southwestward to Deadman's Cove. See pp. 61, 108.

C. CHORDORHIZA Ehrh., var. SPHAGNOPHILA Laestad. Springy swales and quaking bogs in the limestone barrens, Flower Cove, *Fernald, Long & Dunbar*, nos. 26,382, 26,383; swales on limestone barrens, Sandy (Poverty) Cove, *Fernald, Long & Gilbert*, no. 27,588; boggy swales, Eddies Cove, *Fernald, Wiegand & Long*, no. 27,587; the first American records for the variety. See p. 108.

C. STERILIS Willd. Frequent in peat overlying limestone, north to the Straits. See p. 79.

C. DEWEYANA Schwein. Peaty borders of spruce thickets near Mistaken Cove, *Fernald & Griscom*, no. 27,601; glades and openings in spruce thickets east of Big Brook, *Fernald, Wiegand & Hotchkiss*, no. 27,602; meadow below limestone escarpment, western face of Bard Harbor Hill, Highlands of St. John, *Fernald & Long*, no. 27,603; the first authentic collections from Newfoundland. See p. 100.

C. TRISPERMA Dew., var. BILLINGSII Knight. Wet bog-barrens, Trepassey, *Fernald, Long & Dunbar*, no. 26,376. See p. 84. The only other Newfoundland collection is from the East Branch of the Humber.

C. BIPARTITA All. *C. Lachenalii* Schkuhr. See Mackenzie, Bull. Torr. Bot. Cl. 1. 348 (1923). Brookside on slaty hills east of Little Quirpon, *Fernald & Gilbert*, no. 27,622; wet mossy quartzite rocks along Mans Humbug Brook, Highlands of St. John, *Fernald & Long*, no. 27,617; new to Newfoundland. See pp. 121, 124.

C. GLAREOSA Wahlenb. Turfy slopes of slaty hills, Little Quirpon, *Fernald & Long*, no. 27,618, new to Newfoundland. See p. 121.

C. BRUNNESCENS Poir. True *C. brunnescens*, the stiff and low plant with brownish subapproximate ellipsoid spikes is a plant of exposed crests and headlands and southwest of Newfoundland is strictly alpine. The lax plant with remote obovoid greenish spike is var. SPHAEROSTACHYA (Tuckerm.) Kükenthal. It abounds in thickets and woodlands and extends well to the south in the eastern United States. It may prove to be a good species, *C. sphaerostachya* (Tuckerm.) Dewey. Its essential bibliography is: *C. vitilis* a. spiculis virescentibus Fries, Mant. iii. 137 (1842). *C. canescens*, var.  $\gamma$ . *sphaerostachya* Tuckerm. Enum. Meth. 10, 19 (1843). *C. sphaero-*

*stachya* (Tuckerm.) Dew. Am. Journ. Sci. xlix. 44, t. Ee, fig. 110 (1845). *C. vitilis* b. *sylvatica* Meinsh. Fl. Ingr. 402 (1878). *C. canescens*, var. *vulgaris* Bailey, Bot. Gaz. xiii. 86 (1888). *C. brunescens gracilior* Britton in Britt. & Brown, Ill. Fl. i. 351 (1896).

*C. RUPESTRIS* All. Dominant on limestone, western Newfoundland, south to Bay St. George. See p. 62.

*C. NOVAE-ANGLIAE* Schwein. Turfy and silicious rocky slope of Joan Plains Hill, Bay Bulls, *Fernald, Long & Dunbar*, no. 26,417, the first from the Avalon Peninsula. See p. 85.

*C. UMBELLATA* Schkuhr. Barren silicious crests of Joan Plains Hill, Bay Bulls, *Fernald, Long & Dunbar*, no. 26,414; seen but not collected at Trepassey; the first stations on the Avalon Peninsula. See pp. 84, 85.

*C. PEDUNCULATA* Muhl. Woods and thickets on Bard Harbor Hill, Highlands of St. John and on St. John's Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, nos. 27,647, 27,648; extensions northward from Bay of Islands.

*C. CONCINNA* R. Br. Shaded limestone ledges and escarpments, northern half of Burnt Cape, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 27,649, the only Newfoundland station except Mackenzie & Griscom's on Cape St. George. See pp. 101, 102.

*C. GLACIALIS* Mackenzie. Dominant on limestone gravel in western Newfoundland from Quirpon to Bay St. George. See pp. 62, 79, 103, 121.

*C. EBURNEA* Boott. Shaded limestone ledges and escarpments, northern half of Burnt Cape, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 27,659; mossy coniferous woods, lower southwestern slope of Bard Harbor Hill, Highlands of St. John, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,660; extensions north from Bay of Islands.

*C. BICOLOR* All. Wet depressions and margins of rills and pools in the limestone barrens, generally distributed from Pistolet Bay to Ingornachoix Bay, the only known region for the species in America. See pp. 76, 91, 105, 118.

*C. LIVIDA* (Wahlenb.) Willd. See *Fernald, RHODORA*, xxviii. 8 (1926). Turfy limestone barrens, northern half of Burnt Cape, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 27,672, the only known station outside northern Europe and Alberta. See p. 102.

*C. LIVIDA*, var. *RUFINAEFORMIS* Fernald, l. c. (1926). Wet muddy hollow in limestone gravel-barren, Four-Mile Cove, *Fernald, Wiegand & Long*, no. 27,637 (TYPE of the var.). See p. 108.

× *CAREX quirponensis*, n. hybr. (*C. atratiformis* × *Halleri*), laxe caespitosa; culmis 2–6 dm. altis rigidulis superne acute angulatis scabrisque basi vaginis aphyllis atropurpureis deinde fibrillosis obtectis; foliis culmo valde brevioribus 2–4 mm, latis laete viridibus;

spicis 2-4 ellipsoideis 0.7-1.3 cm. longis 4-6 mm. crassis, lateralibus breviter pedunculatis subapproximatis vel imo remotiusculis adscendentibus, terminalibus majoribus gynaeandris; squamis late ovatis obtusis vel subacutis atropurpureis margine plus minusve anguste albo-hyalinis; perigyniis vacuis ovatis planis 3 mm. longis dense papillois enerviis stramineis apice purpurascensibus.—NEWFOUNDLAND: abundant as scattered clumps on the turf and rocky western slope of Cape Dégrat, Quirpon Island, August 7, 1925, *Fernald & Long*, no. 27,696 (TYPE in Gray Herb.)

Although abundant over a large area on the eastern half of Quirpon Island (See p. 121), *Carex quirponensis* is here described as a hybrid because in all the scores of clumps we examined no good achenes could be found and because it is an exact blend of *C. atratiformis* Britton and *C. Halleri* Gunn. (*C. alpina* Sw.), both of which are dominant and very fertile species from Cape Onion to Cape Bauld and Cape Dégrat. A very similar hybrid of *C. atrata* and *C. Halleri* ( $\times$  *C. Candriani* Kneucker) is known in Europe.

*C. HALLERI* Gunn. Dominant in turf or on crests of slate or trap cliffs, eastern end of the Straits Coast: Little Quirpon, *Fernald & Long*, no. 27,697; Quirpon Island, *Wiegand, Gilbert & Hotchkiss*, no. 27,698; Mauve Bay, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,701; Cape Onion, *Fernald*, no. 27,700; Anse aux Sauvages, *Fernald, Wiegand & Long*, no. 27,699; new to Newfoundland. See pp. 121, 123.

*C. STYLOSA* C. A. Meyer. Springy and seepy slopes in peaty barrens among the gneiss hills, Port aux Basques, *Fernald, Long & Dunbar*, no. 26,385 (collected in the same region, and then new to Newfoundland, by *Curtis & Lunt*, in 1912); abundant in damp quartzite gravel or in turf, summit-barrens of Bard Harbor Hill, Highlands of St. John, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,702, *Wiegand, Gilbert & Hotchkiss*, no. 27,703, *Fernald & Long*, no. 27,704; mossy brooksides and turf slopes, Sacred Island, *Wiegand, Gilbert & Hotchkiss*, no. 27,707, *Fernald & Long*, no. 27,708; turf and rocky slopes of Cape Dégrat, Quirpon Island, *Fernald & Long*, no. 27,705. See pp. 56, 110, 121.

*C. RIGIDA* Good. Although common on the bare crests of southwestern Newfoundland, *C. rigida* seems to be rare north of Bonne Bay, a single station: turf and mossy quartzite rocks along Mans Humbug Brook, Highlands of St. John, *Fernald & Long*, no. 27,711. See p. 56.

*C. LENTICULARIS* Michx., var. *ALBI-MONTANA* Dewey. Wet quartzite rocks and gravel along brook, Southwest Gulch, Highlands of St. John, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,719, new to Newfoundland. See p. 124.

*C. SALINA* Wahlenb. The small typical form of the species, with short scales is common on saline shores along the Straits.

*C. SALINA*, var. *PSEUDOFILIPENDULA* (Blytt) Kükenth. As noted on p. 122, this variety occurs on the Labrador side of the Straits and on the Gaspé coast. A plant from the boggy barren south of Ship Cove (*Fernald, Wiegand & Long*, no. 27,732) is an exact match for Scandinavian material cited by Kükenthal as *C. aquatilis* × *C. salina*, var. *pseudofilipendula*, so that the presence in the region of var. *pseudofilipendula* may be inferred.

*C. HOSTIANA* DC., var. *LAURENTIANA* Fern. & Wieg. Glades in spruce swamp, Brig Bay, *Fernald, Long & Dunbar*, no. 26,445, an extension north from Bay of Islands. See p. 79.

*C. OEDERI* Retz., var. *SUBGLOBOSA* (Mielich.) Richter. In clay mixed with limestone gravel, St. John's Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,733. This and material from Pointe Riche (*Fernald & Wiegand*, no. 2912) is all we know from America. See p. 119.

*C. LEPIDOCARPA* Tausch. Wet calcareous soil on the West Coast, northward to the Straits. See p. 118.

*C. MICROGLOCHIN* Wahlenb. Dominant on peaty limestone barrens and in wet tundra, from Pistolet Bay to St. John Bay. See pp. 53, 61, 79, 118.

*C. VESICARIA* L., var. *RAEANA* (Boott) Fern. Boggy barren ("mesh"), south of Ship Cove, *Fernald, Wiegand & Long*, no. 27,758, the only Newfoundland station yet known except on the lower Humber. See p. 122.

*JUNCUS EFFUSUS* L., var. *PYLAEI* (Laharpe) Fern. & Wieg. Bushy swale on flat north of Doctor Hill, St. John Bay, *Fernald & Wiegand*, no. 27,764, the first station north of Bay of Islands. See p. 127.

*J. BULBOSUS* L. Cold brooks, spring-rills, margins of pools, etc., Trepassey, *Fernald, Long & Dunbar*, nos. 26,482, 26,483, and Bay Bulls, no. 26,484; extensions south from the northern Avalon Peninsula. See pp. 50, 81, 83.

*J. ALPINUS* Vill., var. *UNI-BICEPS* Laestad. Wet depressions and borders of pools in limestone barrens and tundra, Cook Point, *Fernald, Gilbert & Hotchkiss*, no. 27,779; Burnt Cape, *Fernald & Long*, no. 27,777; St. John's Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, nos. 27,774, 27,776; the first records from America.

*J. ALBESCENS* (Lange) Fernald. Dominant on wet calcareous barrens from Quirpon to Bay St. George. See pp. 62, 118.

*J. STYGIUS* L., var. *AMERICANUS* Buchenau. Frequent or common southward but rare northward: bare wet peat in depressions in limy bog-barrens, Flower Cove, *Fernald, Long & Dunbar*, no. 26,498; pools in tundra, central valley of Quirpon Island, *Fernald & Long*, no. 27,792; the first stations north of Bonne Bay.

*LUZULA SPICATA* (L.) DC. Abundant along the Straits from Pistolet Bay eastward; also on the Highlands of St. John. Previously known only locally from the East Coast. See p. 110.

*L. CAMPESTRIS* (L.) DC., var. *COMOSA* (Meyer) Fern. & Wieg.

Dry spruce thickets, Curling, *Fernald, Long & Dunbar*, no. 26,499. All previous stations are on the East Coast.

*L. CAMPESTRIS*, var. *CONGESTA* (Thuill.) Meyer. Wet spruce thickets among the gneiss hills back of Port aux Basques, *Fernald, Long & Dunbar*, no. 26,500, the first from eastern America. See p. 56.

*ALLIUM SCHOENOPRASUM* L., var. *laurentianum*, n. var., a var. *sibirico* recedit floribus minoribus (8–10 mm. longis) intense coloratis; segmentis ovatis vel ovato-lanceolatis.—Near the Gulf of St. Lawrence, western Newfoundland, and locally across the continent. NEWFOUNDLAND: along Eddies Cove Brook, July 24, 1925, *Griscom*, no. 27,822; muddy depressions in gravelly limestone barrens one mile back of Savage Cove, July 14, 1925, *Fernald & Long*, no. 27,821; wet places, Flower Cove, July 23, 1921, *M. E. Priest*, no. T5; damp crevices and gravel of limestone, Rock Marsh, Flower Cove, July 30, 1924, *Fernald, Long & Dunbar*, no. 26,512; in clay mixed with limestone gravel, barrens, St. John's Island, July 31, 1925, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,824 (TYPE in Gray Herb.); turfey calcareous western slope under summit of Bard Harbor Hill, July 28, 1925, *Wiegand, Gilbert & Hotchkiss*, no. 27,823; dry limestone cliffs and talus, western face of Doctor Hill, August 24, 1925, *Fernald & Long*, no. 27,825; damp talus of limestone sea-cliffs, Pointe Riche, August 4, 1910, *Fernald & Wiegand*, no. 3069. QUEBEC: Restigouche River, Metapedia, July 23, 1904, *A. S. Pease*, no. 4448. NEW BRUNSWICK: in grass field, Casey's Cape, Kent Co., July 9, 1914, *F. T. Hubbard*. NEW YORK: bank of Black River, Watertown, July 3, 1857, *Wm. Boott*. MONTANA: Belton, Glacier National Park, September 17, 1921, *S. D. McKelvy*. OREGON: Wallawalla, *Tolmie*. WASHINGTON: Marcus, August 18, 1902, *Kreager*, no. 459.

In typical var. *sibiricum* (*A. sibiricum* L.) the perianths are 10–14 mm. long, usually with more attenuate segments and commonly paler (though sometimes intensely colored); and in this variety the pedicels are commonly rather elongated so that the well developed flowering umbels are 3.5–5 cm. in diameter. In var. *laurentianum* the short perianths are intensely colored, the segments commonly less attenuate than in var. *sibiricum* and the pedicels mostly short, the well developed flowering umbels being usually 2.3–3 (rarely –3.3) cm. in diameter. Some specimens from eastern Asia (Ochotsk Sea, *Small*; Amur, *Maximowicz*) apparently belong to var. *laurentianum* and in the note on p. 62 they were mistaken for true var. *sibiricum*.

*STREPTOPUS OREOPOLUS* Fernald, *RHODORA*, viii. 70 (1906). As noted on pp. 104, 116 and 124, this characteristic plant, heretofore known only from the mountains of Gaspé and Matane Cos., Quebec, occurs about Pistolet Bay and abounds in the gulches of Bard Harbor

Hill. In the latter area it fruits heavily, its berries, previously unknown, being slightly elongate as in *S. amplexifolius* (L.) DC. but of a dark cherry-red color as in *S. roseus* Michx.

IRIS SETOSA Pallas, var. CANADENSIS Foster, forma **pallidiflora**, n. f., floribus albescentibus, sepalis plus minusve caeruleo-tinctis.—NEWFOUNDLAND: turfey shore near Nameless Point, Flower Cove, August 2, 1925, *Fernald & Long*, no. 27,843.

A peculiarly attractive color-form of the usually deep blue-violet northern Iris; the petals and stigmas are white and the large sepals also white except for a faint bluish tinge.

CYPRIPEDIUM PARVIFLORUM Salisb., var. **planipetalum**, n. var., humile, 0.8–2.3 dm. altum; foliis 2–4 ellipticis vel ovatis 3–9 cm. longis 1.7–4.5 cm. latis; sepalis viridibus vel stramineis plus minusve purpureotinctis, superiori ovato 2.2–4 cm. longo 0.8–2.2 cm. lato apice acuto vix acuminato basi rotundato, inferioribus connatis minoribus; petalis stramineis vel purpurascensibus oblongo-lanceolatis planis 2.5–4 cm. longis 0.4–1 cm. latis; labello dorso-ventraliter compresso aureo-flavo 2–4 cm. longo; staminodio basi cordato.—Western NEWFOUNDLAND: turfey limestone barrens, northern half of Burnt Cape, Pistolet Bay, July 17, 1925, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 27,855; southern half of Burnt Cape, August 3, 1925, *Fernald & Long*, no. 27,857; peaty slopes of limestone barrens on the Highlands east of Big Brook, Straits of Belle Isle, July 16, 1925, *Fernald, Wiegand & Hotchkiss*, no. 27,854; peaty and bushy areas on limestone barrens one mile back of Savage Cove, Straits of Belle Isle, July 14, 1925, *Fernald & Long*, no. 27,851 (TYPE in Gray Herb.), 27,852 (aberrant individuals); mossy spruce thickets bordering limestone barrens near Ice Point, St. Barbe Bay, July 14, 1925, *Wiegand, Gilbert & Hotchkiss*, no. 27,853; turfey limestone barrens, St. John's Island, St. John Bay, July 31, 1925, *Fernald et al.* no. 27,856; Bay of Islands, July 5, 1906, *C. W. Townsend*; turfey slopes of the marble region between Mt. Musgrave and Humber Mouth, July 18, 1910, *Fernald, Wiegand & Kittredge*, no. 3096; highest summits of the Lewis Hills, July, 1911, *L. S. Sanford*; in humus or turf on the limestone tableland, alt. 200–300 m., Table Mountain, Port-à-Port Bay, July 16 & 17, 1914, *Fernald & St. John*, no. 10,815.

Var. *planipetalum* is distinguished from both *C. parviflorum* and *C. parviflorum*, var. *pubescens* (Willd.) Knight by its short and comparatively broad, flat, usually purplish petals, by the relatively shorter and broader upper sepal with less acuminate or elongate tip and with rounded rather than abruptly narrowed or subcuneate base, and by the cordate staminodium; *C. parviflorum* and its var. *pubescens* having the commonly paler petals linear to linear-lanceolate,



mostly spirally curled and 3.5–9 cm. long, the narrower upper sepal long-acuminate at tip and usually tapering at base, 2.5–5 cm. long in typical *C. parviflorum*, 5–8 cm. in var. *pubescens*. In typical *C. parviflorum* the staminodium is narrowed to subtruncate at base; in the large-flowered var. *pubescens* it is frequently subcordate, in this character approaching var. *planipetalum*. The plant of the Newfoundland barrens is low (mostly 1–2 dm. high) with only 2–4 (usually 3) dilated leaves below the bract; *C. parviflorum* and var. *pubescens* are taller and with 3–5 (usually 4) larger leaves. A battered specimen of Waghorne's from woods at Coal River, Newfoundland is typical *C. parviflorum* and specimens from the Mingan Islands, Anticosti, Gaspé and Alberta strongly approach var. *planipetalum* in having broad and flat petals but the staminodium not cordate as in the Newfoundland plant.

In its broad and flat petals *C. parviflorum*, var. *planipetalum* strongly suggests the Eurasian *C. Calceolus* L. and such a plate as that of Redouté, *Les Liliacées*, i. t. 19 looks almost intermediate between *C. parviflorum* and var. *planipetalum*; and in some European specimens of *C. Calceolus* the staminodium shows a very strong tendency to be cordate at base. In both *C. Calceolus* and *C. parviflorum*, var. *pubescens*, however, the staminodium is longer-stalked than in true *C. parviflorum* and var. *planipetalum* and the sepals and petals of the Eurasian plant are more consistently purple than in the American series. They are very close, however, and it need not be surprising if, with better knowledge of the variations of the two series, the Eurasian and American plants are eventually treated as one polymorphous circumpolar species. See p. 95.

ORCHIS ROTUNDIFOLIA Pursh. Peaty or turfy depressions in limestone barrens, frequent, often very abundant, from Pistolet Bay westward to Sandy (Poverty) Cove; new to Newfoundland. See. pp. 97, 100, 103.

THE VARIATIONS OF HABENARIA VIRIDIS.—*Habenaria viridis* (L.) R. Br. is not generally recognized as occurring outside the northern and mountainous regions of Eurasia, its American representatives passing very generally as *H. bracteata* (Muhl.) R. Br. or as *H. viridis*, var. *bracteata* (Muhl.) Gray or, by those who treat the sections of *Habenaria* as genera, as *Coeloglossum bracteatum* (Muhl.) Parl.

The latter plant, with very long and divergent linear-lanceolate bracts is typical of the cooler sections of the Alleghenian and the

warmer sections of the Canadian regions of eastern American—from Newfoundland and Gaspé west to southern Alberta and south in rich woods and meadows to New Jersey, Pennsylvania, Ohio, Illinois and Iowa; and it also occurs in temperate eastern Asia (Japan, China, etc.). The plant of western America, from Alaska south to southern British Columbia, Colorado, the Black Hills and locally to Lake Huron, has the bracts broader, shorter and more ascending than in the common northeastern plant and in the Old World seems to be confined to extreme northeastern Asia. Superficially it resembles the European plant which there passes as *Coeloglossum viride*, var. *bracteatum* Richter, but it is not a good match for the eastern American plant which was first published as *Orchis bracteata* Muhl.<sup>1</sup>

The fact that the plant of western America is not satisfactory *Habenaria bracteata* or *H. viridis*, var. *bracteata* had long been apparent but, like most such questions, its proper working out had been left over until some more convenient moment. Now, however, with the necessity of settling satisfactorily the exact identity of the plant which abounds on the limestone shores and barrens on the south side of the Straits of Belle Isle in northwestern Newfoundland, it has seemed appropriate to review the plants which are passing in different regions as *Habenaria viridis* or *Coeloglossum viride*.

The typical plant of Europe and adjacent Asia, the plant first published as *Satyrium viride* L.,<sup>2</sup> has a comparatively lax raceme with the lowest bracts at most twice as long as the flowers, the middle and upper bracts decidedly shorter, the flowers varying from greenish to red (see for example the plate of *Platanthera viridis* in Reichenbach fil., *Icones*, xiv. t. 434). Its lip, as shown by about 80 individuals before me and by the European plates, is 3-toothed at apex, as regularly described, the middle tooth, though shorter than the two lateral ones, being well developed. Of somewhat rarer occurrence in Europe is an extreme development, with the bracts more prolonged, the lower 2-3 times as long as the flowers, the upper equaling or exceeding them; but in this long-bracted European plant the lip is like that of typical European *H. viridis* and the bracts are spreading-ascending. It is, apparently, only an extreme variation of the

<sup>1</sup> Muhl. in Willd. Sp. Pl. iv. 34 (1805).

<sup>2</sup> L. Sp. Pl. ii. 944 (1753).

European type and may be the plant which Linnaeus meant as *Satyrium viride*,  $\beta$ .:

“ $\beta$ . *Orchis palmata batractites*. *Bauh. pin.* 86. *Vaill. paris.* 153. t. 31. f. 6, 7, 8.”<sup>1</sup>

The Vaillant figures, however, show only details of the flowers and nothing of the raceme as a whole, while Bauhin gives no more satisfaction, except to carry the reference back to *Serapias Batrachites vel Myoides* of Lobelius, *Icones Stirpium*, where we find an excellent figure of the short-bracted typical *Habenaria viridis*. The long-bracted plant was perhaps meant by Tenore when he described *Orchis viridis*,  $\beta$ . *Vaillantii*<sup>2</sup> and Schur clearly described it as *Peristylus viridis* (L.) Lindl., b. *macrobracteata*,<sup>3</sup> from Transylvania, but in general it is treated in Europe as identical with the Alleghenian plant which Muhlenberg sent to Willdenow as *Orchis bracteata*.

In the latter plant not only are the long linear-lanceolate lower bracts strongly, often horizontally, divergent but the middle and upper are much more prolonged than in the long-bracted European plant. Furthermore, the ordinarily narrower (nearly linear) lip is usually only bifid at apex, the 3d or middle tooth which is prolonged in the European plant, usually being nearly or quite obsolete, just as originally described by Muhlenberg through Willdenow: “*Labellum lineare dependens, apice bifidum cum mucrone parvo obscuro inter lacinias, saepius deficiente.*” With its patent and very narrow bracts, its uniformly green or greenish (never highly colored) flowers and its usually narrower lip with the middle tooth ordinarily suppressed *Habenaria bracteata* would constitute a fairly distinct Alleghenian-eastern Asiatic species, were it not for the plant of western America, northeastern Asia and extreme northwestern Newfoundland, a plant with a range which is thoroughly typical and with characters which place it exactly between *H. bracteata* on the one hand and the long-bracted extreme of European *H. viridis* on the other.

The plant of northwestern Newfoundland, originally discovered there by Miss Mary E. Priest in July, 1921, found by Messrs. Long, Dunbar and me in August, 1924, and found in great quantity by our party of 1925, in habit is quite like the long-bracted European plant, *Orchis viridis*, var. *Vaillantii* Ten. or *Peristylus viridis*, var. *macrobracteata* Schur., the smallest specimens closely matching plants from

<sup>1</sup> L. Sp. Pl. ii. 944 (1753).

<sup>2</sup> Ten. Syll. Add. 629 (1831). I have been unable to see Tenore's original account.

<sup>3</sup> Schur, Enum. Pl. Transsilv. 645 (1885).

the Faroe Islands, the taller specimens strikingly like Reichenbach's plate of the long-bracted Bohemian plant; but of the 192 individuals before me while writing, the oblong to narrowly cuneate-oblong lip of all but three or four has the tip consistently with 2 broad and flat teeth and quite without the median tooth of the European plant. In very exceptional individuals the median tooth is developed, just as it is in exceptional individuals of *H. viridis*, var. *bracteata*. The smallest plants of northern Newfoundland are quite identical in all characters with material from northeastern Asia (Arakamtchetchene Island, Bering Straits, *Chas. Wright*; "in monticulo aprico saxoso," Ajan, Ochotsk Sea, *Tiling*); while the larger plants are quite like the plant of western America which has there passed as *H. bracteata*. This plant of western America has the lip almost uniformly 2-toothed at apex, with the median tooth obsolete, but in occasional individuals the 3d tooth is evident.

The whole series seems to form a polymorphous circumpolar species, the American and eastern Asiatic varieties with the lip generally 2-toothed, the European with it more consistently 3-toothed; but with enough departures in the American series to indicate that the plants are not specifically separable.

The conclusions reached in this study are summarized below.

*HABENARIA VIRIDIS* (L.) R. Br. in Ait. Hort. Kew. ed 2, v. 192 (1813). *Satyrium viride* L. Sp. Pl. ii. 944 (1753). *Orchis viridis* (L.) Crantz, Stirp. ed. 2: 491 (1769). *Coeloglossum viride* (L.) Hartm. Handb. 329 (1820). *Platanthera viridis* (L.) Lindl. Synop. Brit. Fl. 261 (1829). *Himantoglossum viride* (L.) Reichenb. Fl. Excurs. 119 (1830). *Peristylus viridis* (L.) Lindl. Synop. Brit. Fl. ed. 2: 261 (1835). *Peristylus viridis*, b. *gracillima* Schur, Enum. Pl. Transsilv. 645 (1885). For further synonymy see Richter, Pl. Eu. i. 277 (1890).—Raceme rather lax: lowest bracts equaling to twice as long as the flowers: middle and upper bracts shorter than the flowers: flowers green or yellowish varying to red: lip distinctly 3-toothed at apex; the middle tooth prolonged but shorter than the lateral.—Europe and western Asia.

Var. **Vaillantii** (Ten.), n. comb. *Orchis viridis*,  $\beta$ . *Vaillantii* Ten. Syll. Add. 629 (1831). *H. bracteata* of European authors, not *Orchis bracteata* Muhl. *Platanthera viridis*, var. *bracteata* Reichenb, f. Ic. xiv. 130, t. 435, fig. 1 (1851) not *Orchis bracteata* Muhl. *Coeloglossum bracteatum* Parl. Fl. Ital. iii. 409 (1858) as to plant, not as to name-bringing synonym, *Orchis bracteata* Muhl. *C. viride*, b. *bracteatum* Richter, Pl. Eu. i. 278 (1890) as to plant, not *Orchis bracteata* Muhl. *Peristylus viridis*, b. *macrobracteata* Schur, Enum. Pl. Transsilv. 645 (1885).—Raceme commonly denser, often more elongate: lower

bracts 2–3 times as long as the flowers, spreading-ascending; upper bracts equaling or exceeding the flowers: lip 3-toothed at apex.—Europe and adjacent Asia.

Var. **interjecta**, n. var., 0.5–3.5 dm. alta; foliis 2–5 inferioribus oblongis vel oblongo-obovatis apice rotundatis, superioribus oblongo-lanceolatis acutis; racemo subcapitato deinde longe cylindrico 0.2–1.7 dm. longo; bracteis subadscendentibus, inferioribus lanceolatis vel anguste ovatis floribus dimidio-triplo longioribus, mediis superioribusque floribus brevioribus vel paulo longioribus; floribus viridibus; labio oblongo vel oblongo-cuneato apice bidentato dentibus oblongis vel deltoideis, dento intermedio obsoleto vel rare producto.—Northwestern Newfoundland; Michigan; Alaska to South Dakota, Colorado and southern British Columbia; northeastern Siberia NEWFOUNDLAND: turfey limestone barrens, northern half of Burnt Cape, Pistolet Bay, July 17, 1925, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 27,872; turfey limestone barrens, Cook Point, Pistolet Bay, July 18, 1925, *Fernald & Gilbert*, no. 27,873; Cook Point, August 13, 1925, *Fernald, Gilbert & Hotchkiss*, no. 27,876; turfey limestone barrens, Boat Harbor, Straits of Belle Isle, July 19, 1925, *Fernald, Wiegand & Long*, no. 27,874; turfey limestone slope near the sea, Four-mile Cove, Straits of Belle Isle, July 20, 1925, *Fernald, Long & Wiegand*, no. 27,875; gravelly and peaty limestone barrens back of Big Brook, Straits of Belle Isle, July 15, 1925, *Fernald & Long*, no. 27,869; turfey and peaty slopes of limestone escarpment east of Big Brook, July 15, 1925, *Wiegand, Gilbert & Hotchkiss*, no. 27,868; turfey limestone slopes east of Big Brook, July 16, 1925, *Fernald, Wiegand & Hotchkiss*, no. 27,870 (TYPE in Gray Herb.); mossy knolls in tundra back of Big Brook, July 16, 1925, *Pease & Griscom*, no. 27,871; on knolls of *Empetrum nigrum*, *Salix reticulata*, etc., Sandy (or Poverty) Cove, August 1, 1924, *Fernald, Long & Dunbar*, no. 26,532; July 12, 1925, *Fernald & Griscom*, no. 27,865; turfey border of gravelly limestone beach, Savage Point, July 13, 1925, *Fernald, Wiegand, Pease, Long, Gilbert & Hotchkiss*, no. 27,867; damp limestone barrens, Yankee Point, July 12, 1925, *Wiegand & Hotchkiss*, no. 27,866; turfey and gravelly limestone strand, Yankee Point, August 16, 1925, *Fernald, Wiegand & Long*, no. 27,877; barrens, Flower Cove, July 15, 1921, *M. E. Priest*. MICHIGAN: Macinac Island, July 12, 1915, *W. H. Manning* (transition to var. *bracteata*). MANITOBA: Lake Winnipeg Valley, 1857, *Bourgeau*. SOUTH DAKOTA: under willows, on slaty soil, edge of Bald Hills, June 5, 1910, *J. Murdock, jr.*, no. 4064. SASKATCHEWAN: Moose Mountain, July 3, 1880, *J. Macoun*, no. 173. ALBERTA: prairie slough, Calgary, June 19, 1903, *M. A. Barber*, no. 192; Banff, July 11, 1891, *Macoun*, no. 2827, July, 1906, *S. Brown*, no. 157. WYOMING: wet woods, Black Hills, July 25, 1910, *A. Nelson*, no. 9506 (as *Limnorchis borealis*). COLORADO: meadow, vicinity of Long's Peak, Larimer Co., August 21, 1914, *F. W. Hunnewell, 2nd*. BRITISH COLUMBIA: woods near

Emerald Lake, Selkirk Mts., July 4, 1904, *H. Petersen*, no. 75; Cascade Mts., lat. 49°, 1859, *Lyall*. ALASKA: Disenchantment Bay, August 12, 1892, *Funston*, no. 112; Kodiak, July 24, 1904, *Piper*, no. 4438. SIBERIA: Arakamtchetchene Island, Bering Straits, 1853-56, *C. Wright*; "in monticulo aprico saxoso," Ajan, 1851, *Tiling*. See pp. 54, 76, 91, 105.

Var. BRACTEATA (Muhl.) Gray, *Man.* ed. 5: 500 (1867). *Orchis bracteata* Muhl. in Willd. *Sp.* iv. 34 (1805). *O. bractealis* Salisb. *Paradis.* t. 110 (1806-7). *Satyrium bracteatum* (Muhl.) Pers. *Syn.* ii. 507 (1807). *S. bracteale* Salisb. *Trans. Hort. Soc.* i. 290 (1812). *H. bracteata* (Muhl.) R. Br. in Ait. *Hort. Kew.* ed. 2, v. 192 (1813). *Peristylus bracteatus* Lindl. *Gen. & Sp. Orch.* 298 (1835). *Platanthera bracteata* (Muhl.) Torr. *Fl. N. Y.* ii. 279 (1843). *Cocloglossum bracteatum* (Muhl.) Parl. *Fl. Ital.* iii. 409 (1858), as to name-bringing synonym. *Platanthera viridis*, var. *bracteata* (Muhl.) Reichenb. f. *Icon.* xiv. 130, as to name-bringing synonym.—1.3-4.5 dm. high: raceme lax, 0.3-1.8 dm. long: bracts linear-lanceolate, divergent; the lower and median 2-4 times as long as the green flowers; the uppermost equaling to twice as long as the flowers: lip linear to oblong, 2-toothed at apex, rarely with an intermediate short tooth.—Woods and meadows, Newfoundland to southern Alberta, south to New Jersey, Pennsylvania, Ohio, Illinois and Iowa; Japan, China, etc.

HABENARIA **straminea**, n. sp., *H. albidae* similis; caulibus 1-3.4 dm. altis; foliis inferioribus 2-4 oblongo-obovatis obtusis vel subacutis 2-7 cm. longis 0.8-3.5 cm. latis basi supravaginali cuneatis, superioribus minoribus acuminatis in bracteas decrescentibus, omnibus internodiis subaequalibus; spicis cylindricis plurifloris densis (floribus inferioribus subremotis) 3-10 cm. longis 1.2-2 cm. crassis; bracteis lanceolatis acuminatis ovariiis duplo longioribus; ovariiis fusiformibus anthesi tortis 4-6 mm. longis; sepalis stramineis anguste ovatis apicem versus plus minusve attenuatis tenuibus valde 3-nervatis 2.7-4 mm. longis; petalis lateralibus anguste ovatis apicem versus angustatis tenuibus valde 3-5-nervatis sepala vix aequantibus; labello submembranaceo 3-5 mm. longo late cuneato trifido lobis lanceolato-deltaideis subaequalibus valde 2-3-nervatis; calcare cylindrico-clavato obtuso 2-3 mm. longo.—Newfoundland, Greenland, Iceland and the Faroe Islands. NEWFOUNDLAND: turfey limestone barrens, northern half of Burnt Cape, Pistolet Bay, July 17, 1925, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 27,889; peaty and turfey glades and open slopes, Schooner (or Brandy) Island, Pistolet Bay, July 18, 1925, *Pease & Long*, no. 27,891; moist turfey or peaty depressions in limestone barrens, Cook Point, Pistolet Bay, July 18, 1925, *Fernald & Gilbert*, no. 27,890; boggy depressions in limestone barrens, Cape Norman, July 18, 1925, *Wiegand, Griscom, & Hotchkiss*, no. 27,892 (TYPE in Gray Herb.), August 13, 1925, *Wiegand & Long*, no. 27,895; turfey limestone barrens, Four-Mile Cove, Straits of Belle Isle, July 20, 1925, *Fernald, Wiegand & Long*,

no. 27,893; depressions in tundra one mile back of Savage Cove, Straits of Belle Isle, July 23, 1925, *Fernald, Pease & Long*, no. 27,894. GREENLAND: Julianehaab, 1859, *Rink*; Skansen, Disco, July 8, 1921, *E. A. Porsild*; Disco, 1870, *Berggren*; rich damp soil by brook, Godhavn, August 4, 1878, *Krumlein*; Knanersok, lat. 62°, July 11, 1889, *Hartz*; ca. Neria, lat. 61° 33', July 8, 1924, *Eugenius*. ICELAND: Reykjahlid, July 25, 1895, *Elizabeth Taylor*. FAROE ISLANDS: Mornafjeld Videro, July 11, 1905, *Elizabeth Taylor*.

The material of *Habenaria straminea* from Greenland, Iceland and the Faroe Islands has regularly passed as *H. albida* (L.) R. Br. From that European species it differs, however, in its thicker spike (in *H. albida* only 0.7–1.3 cm. thick); longer bracts (in *H. albida* rarely much overtopping the ovary); stramineous sepals which are narrower, longer and thinner and with more evident nerves (in *H. albida* the firm white or whitish sepals 2–3 mm. long, with only the midnerve prominent); longer thinner and definitely nerved petals; longer and thinner clearly nerved lip (in *H. albida* the firm and thick yellowish lip about 2 mm. long and opaque to transmitted light); and longer spur.

In *H. straminea*, as found in northwestern Newfoundland, the flowers have a delicious fragrance suggestive of vanilla and *Krumlein* noted that the Greenland plant has "Fl. pale greenish yellow, sweet scented." Whether the fragrance is different from that of *H. albida* I cannot say. In *H. albida* the short lip is described as horizontal or projected forward. In the herbarium-material of *H. straminea* it is often slightly drooping; whether this character is diagnostic cannot be settled without fresh material. See pp. 102, 105, 106.

HABENARIA OBTUSATA (Pursh) Richardson, var. **collectanea**, n. var., a var. typica recedit racemo 1–4.5 cm. longo floribus approximatis vel subapproximatis; scapo quam folio breviori vel eo paulo superante—Labrador, western Newfoundland, eastern Quebec, northern Manitoba and Alaska. LABRADOR: Indian Harbor, Hamilton Inlet, August 2, 1891, *Bowdoin College Exped.* no. 198; Red Bay, July 4, 1892, *Sornberger*, no. 74; springy banks and damp hillsides, Forteau, July 30, 1910, *Fernald & Wiegand*, no. 3112; gravelly thicket back of strand, Blanc Sablon, August 4, 1910, *Fernald & Wiegand*, no. 3114. NEWFOUNDLAND: mossy brooksides and damp turfy slopes, Sacred Island, Straits of Belle Isle, August 10, 1925, *Fernald & Long*, no. 27,899; mossy and turfy trap cliffs and talus, Anse aux Sauvages, Pistolet Bay, August 11, 1925, *Fernald, Wiegand & Long*, no. 27,900; gravelly and peaty limestone barrens back of Big Brook, July 15, 1925, *Fernald & Long*, nos. 27,897, 27,901; open woods, Flower Cove, July 26, 1921, *Mary E. Priest*; turfy limestone barrens, St. John's

Island, July 31, 1925, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,898 (TYPE, in Gray Herb.); damp talus of limestone sea-cliffs, Pointe Riche, August 4, 1910, *Fernald & Wiegand*, no. 3115. QUEBEC: mossy evergreen woods, Goynish, July 5, 1915, *St. John*, no. 90,335; sur les rivages calcaires, Ile à Marteau, Archipel de Mingan, Juillet 15, 1924, *Marie-Victorin & Rolland-Germain*, no. 18,763. MANITOBA: Churchill, lat. 58° 50', July 26, 1910, *J. M. Macoun*, no. 79,195. ALASKA: Nagai Island, Shumagin Islands, August 1, 1872, *M. W. Harrington*.

In its crowded raceme *H. obtusata*, var. *collectanea* strongly simulates *H. clavellata*, but in all technical characters it is clearly an extreme of *H. obtusata*. In the typical form of the species, a woodland plant, the flowers are remote, forming a loosely alternate-flowered slender raceme which (except in the smallest specimens) is 5–17 cm. long; and the scape usually much exceeds the leaf. See p. 92.

HABENARIA LACERA (Michx.) R. Br., var. TERRAE-NOVAE Fernald. For discussion see RHODORA, xxviii. 21 (1926); also p. 57.

CORALLORHIZA ERICETORUM Drejer. One plant at border of spruce thicket on limestone barren south of Flower Cove, *Pease, Long, & Gilbert*, no. 27,920; two plants in tundra back of Big Brook, *Pease & Griscom*, no. 27,922; one plant in boggy tundra, Schooner (Brandy) Island, *Pease & Long*, no. 27,923; new to America. See p. 93.

MALAXIS **brachypoda** (Gray), n. comb. *Microstylis brachypoda* Gray, Ann. Lyc. Nat. Hist. N. Y. iii. 227 (1835). *Mal. monophyllos* of eastern American authors, not (L.) Sw. *Mic. monophyllos* of eastern American authors not (L.) Lindl.

In his younger days, when he was closely studying plants in the field, Asa Gray clearly understood the distinctions between the plant of eastern North America and *Malaxis monophyllos* (L.) Sw. or *Microstylis monophyllos* (L.) Lindl. of Eurasia; but, overwhelmed apparently by the opinions of Hooker, Lindley, and Torrey, he abandoned his species and, so far as I can find, no one has subsequently suggested that our plant and the Eurasian are not identical. The two are, however, thoroughly distinct; their contrasts are indicated below.

M. MONOPHYLLOS. Flower-bud just before expanding ovate-lanceolate, 2–3 mm. long: pedicel and ovary during anthesis 2.5–4 mm. long: expanded perianth 4–6.5 mm. broad: flower resupinate, the lip and lateral sepals subconnivent and projected forward: capsules 5–7 mm. long, on twisted pedicels 3–5 mm. long, crowned by the subconnivent ascending perianth-segments.

M. BRACHYPODA. Flower-bud just before expanding ovate, 1.5–2 mm. long: pedicel and ovary during anthesis 1.5–3 mm. long: expanded perianth 3–5 mm. broad: perianth-segments (including the lip)



strongly divergent, perpendicular to the axis of the ovary, finally reflexed and appressed to the ovary, the lip drooping: capsules 3–5 mm. long, on straight pedicels 1–2 mm. long, crowned by the reflexed and appressed perianth-segments. See p. 92.

*Malaxis diphyllus* Cham. Linn. iii. 34 (1829), from Unalaska is the Eurasian *M. monophyllos*. This is indicated by Chamisso's description of it as having "Flores exacte *M. monophylli*, . . . labellum . . . , erectum"; and by the figure of Chamisso's material published by Reichenbach fil. Ic. Fl. Germ. et Helv. xiii & xiv. t. cccxciii. fig. iii (1851). In *M. brachypoda* the raceme tends to be shorter than in *M. monophyllos*, though the median measurements overlap. In the 16 specimens of the latter before me the inflorescences range from 2–14 cm. in length, with an average length of 7.3 cm. Ten times that number of specimens (161) of *M. brachypoda* show a range from 1–11.5 (av. 4.5) cm.

CALYPSO BULBOSA (L.) Oakes. Mossy spruce woods, very scarce, north of Doctor Hill and on western slope of Bard Harbor Hill, St. John Bay, *Fernald & Long*, nos. 27,930, 27,931; new to Newfoundland. See p. 125.

SALIX LUCIDA Muhl. Thickets along East Brook, St. Barbe Bay, *Wiegand & Hotchkiss*, no. 27,932, our only Newfoundland collection from north of the Humber.

S. RETICULATA L. Dominant and very variable on calcareous barrens and slopes from Quirpon to Ingornachoix Bay; leaves varying from oblong to orbicular and from 0.5–4.5 cm. long. See pp. 53, 59, 62, 79, 118.

S. VESTITA Pursh. Dominant on calcareous slopes and barrens from Quirpon to Bay St. George. See pp. 75, 79, 117.

S. HERBACEA L. Mossy shelves of slaty cliffs, upper Deer Pond Brook, Highlands of St. John, *Fernald & Long*, no. 27,954, the first station in Newfoundland. See p. 124.

SALIX **jejuna**, n. sp., frutex depressus *S. anglorum* simulans; ramulis repentibus gracilibus glabris olivaceis vel badiis; foliis breviter oblongis vel late ellipticis apice basique subacutis vel rotundatis coriaceis 0.6–2.5 cm. longis 0.2–1.8 cm. latis integris utrinque glabris vel laxe villosis glabratisque reticulatis supra viridibus lucidis subtus glaucescentibus; petiolis 1–5 mm. longis superne sulcatis glabris; stipulis rare evolutis lineari-lanceolatis pilosis 1.5–2.5 mm. longis; gemmis ovoideis obtusis glabris badiis vel stramineis ad 3.5 mm. longis; amentis fructiferis 0.6–1.8 cm. longis 7–9 mm. crassis ramulos foliatos 0.4–2 cm. longos plus minusve pilosos terminantibus; bracteis oblongo-obovatis fuscis vel purpurascensibus sericeo-pilosis vel apice glabratis 1–1.7 mm. longis; capsulis conico-ovoideis obtusis 3–4 mm. longis dense villosis-tomentosis vel glabratis sessilibus vel subses-

silibus; stylo distincto ad 0.3 mm. longo apice bifido stigmata bifida subaequanti; glandula bractea brevior.—Straits of Belle Isle, Labrador and Newfoundland. LABRADOR: Henley Island, Chateau Bay, September 7, 1923, *A. G. Huntsman*. NEWFOUNDLAND: dry rocky and gravelly limestone barrens, Cape Norman, July 18, 1925, *Wiegand, Griscom & Hotchkiss*, no. 27,947, August 13, 1925, *Wiegand & Long*, no. 27,950 (TYPE in Gray Herb.); gravelly limestone barren, Four-Mile Cove, Straits of Belle Isle, July 20, 1925, *Fernald, Wiegand & Long*, no. 27,949; limestone sea-cliffs east of Big Brook, July 16, 1925, *Fernald, Wiegand & Hotchkiss*, no. 27,986. See p. 100.

*Salix jejuna* is as yet known only in mature fruit. At all the Newfoundland stations it was a very insignificant shrub, forming mats only 0.3–2 dm. across and closely associated with the wholly different *S. calcicola* Fern. & Wieg. In its largest extreme it resembles small shrubs of *S. anglorum* var. *kophophylla* Schneider of the serpentine areas about Bonne Bay and the Bay of Islands, Newfoundland and of Mt. Albert, Quebec; but it is at once distinguished by its tiny fruiting aments, extraordinarily short capsules and short style; *S. anglorum* and its varieties having fruiting aments 3–5 cm. long, capsules 7–8 mm. long and styles comparatively long (toward 1 mm. or even 1.5 mm.). Typical arctic *S. anglorum* reaches its southern limit in Labrador at latitude 55°,—250 miles (400 km.) north of the Straits. Southward *S. anglorum* is represented by three varieties which are confined to serpentine barrens of western Newfoundland and Gaspé; *S. jejuna*, however, in all its Newfoundland stations is on limestone and 180 miles (290 km.) northeast of the nearest known station of *S. anglorum*, var. *kophophylla*.

*S. ARCTOPHILA* Cockerell. Dominant in damp tundra or on peaty knolls in limestone barrens from Pistolet Bay to St. Barbe Bay, our only other record being from Table Mt., Port-à-Port Bay. See pp. 53, 62, 118.

*SALIX ARCTOPHILA* Cockerell, forma **lejocarpa** (And.), n. comb. *S. arctica*,  $\gamma$  *groenlandica*, var. *lejocarpa* And. in DC. Prodr. xvi. pt. 2: 287 (1868). *S. groenlandica*, forma *lejocarpa* (And.) Lange, Consp. Fl. Groenl. i. 108 (1880). *S. arctophila*, var. *lejocarpa* (And.) Schneider, Bot. Gaz. lxxvii. 57 (1919).

The plant is surely not a geographic variety but merely a form, colonies of it occurring scattered through the range of the typical form, which has lightly pubescent capsules.

(To be continued.)